CLAIMS

1. A method of dynamically determining the spatial position and orientation of a slider positioned above a transparent disk, the method comprising the steps of:

directing one or more incident beams of light to the interface between the slider and the disk;

simultaneously measuring values derived from one or more beams of light reflected from said slider-disk interface, said simultaneously measured values respectively corresponding with multiple testing points on the surface of the slider which are spaced apart from each other; and

calculating the spatial orientation of the slider based on said simultaneously measured values.

2. A method as claimed in claim 1, wherein said values are used to derive an indication of the respective spacing between the surface of the transparent disk and each of said multiple testing points on said slider surface.

3. A method as claimed in claim 1, wherein the number of said multiple testing points is equal to or greater than the number of degrees of freedom said slider has in its movement above the transparent disk, so that the spatial orientation of the slider can be fully determined.

4. A method as claimed in claim 3, wherein said number of degrees of freedom, and the number of said multiple values are both equal to three.

5. A method as claimed in claim 1, wherein the spatial orientation of the slider is characterized in terms of (i) a spacing between the slider and the disk surface, (ii) a pitch angle and (iii) a roll angle of the slider with respect to the disk surface.

6. A method as claimed in claim 1, wherein said one or more beams of light each have two or more wavelengths, and said values include the relative intensities of said two or more wavelengths after reflection from the slider-disk interface.

7. A method as claimed in claim 1, wherein said one or more beams of light have two orthogonal vectors of polarisation, and said values include the intensities of the two vectors of polarisation after reflection from the slider-disk interface.

8. A method as claimed in claim 7, wherein said one or more beams of light are incident on said slider-disk interface at an angle substantially between 0° and 80°.

9. A method as claimed in claim 6, wherein said multiple values are simultaneously measured by using a series of cascaded mirrors having pinholes to isolate reflected light respectively corresponding with each of said multiple testing points from one beam of light reflected from the slider-disk interface.

10. A method as claimed in claim 1, wherein said multiple values are simultaneously measured by independently using more than one of said one or more beams of light reflected from said slider-disk interface.

11. A method as claimed in claim 1, wherein the minimum flying height of the slider is determined once the spatial orientation of the slider is determined, and the surface geometry of the slider is known.

12. An apparatus for dynamically determining the spatial orientation of a slider positioned above a transparent disk, the apparatus comprising:

optical means for directing one or more incident beams of light to the interface between the slider and the transparent disk;

measuring means for simultaneously measuring values of light properties of one or more beams of light reflected from said slider-disk interface, the simultaneously measured values respectively corresponding with multiple testing points on the surface of the slider which are spaced apart from each other; and

calculating means for calculating the spatial orientation of the slider based on said simultaneously measured values.

13. An apparatus as claimed in claim 12, wherein said calculating means can use said values measured by said measuring means to derive an indication of the respective spacing between the surface of the transparent disk and each of said multiple testing points on said slider surface.

14. An apparatus as claimed in claim 12, wherein the number of said multiple testing points is equal to or greater than the number of degrees of freedom said slider has in its movement above the transparent disk, so that the spatial orientation of the slider can be fully determined.

15 An apparatus as claimed in claim 14, wherein said number of degrees of freedom and the number of said multiple values are both equal to three.

16. An apparatus as claimed in claim 12, wherein the calculation means is able to calculate the spatial position and orientation of the slider in terms of (i) a distance from the transparent disk surface, (ii) a pitch angle and (iii) a roll angle.

17. An apparatus as claimed in claim 12, wherein said optical means is able to provide one or more beams of light each have two or more discrete wavelengths, and said measuring means is able to measure values which include the relative intensities of two or more discrete wavelengths after reflection from the slider-disk interface.

18. An apparatus as claimed in claim 12, wherein said optical means is able to provide one or more beams of light have two orthogonal vectors of polarisation, and said measuring means is able to measure values which include the relative intensities of the two vectors of polarisation after reflection from the slider-disk interface.

19. An apparatus as claimed in claim 18, wherein said optical means is able to direct one or more beams of light to be incident on said slider-disk interface at an angle substantially between 0° and 80°.

20. An apparatus as claimed in claim 17, wherein said measurement means is able to simultaneously measure said multiple values by using a series of cascaded mirrors having pinholes to isolate reflected light respectively corresponding with each of said multiple testing points from one beam of light reflected from the slider-disk interface.

21. An apparatus as claimed in claim 12, wherein said measurement means is able to simultaneously measure said multiple values by independently using more than one of said one or more beams of light reflected from said slider-disk interface.

22. A method as claimed in claim 12, wherein the calculation means is able to determine the minimum flying height of the slider once the spatial orientation of the slider is determined and the surface geometry of the slider is known.